SUPPORTING INFORMATION FOR:

The Potential Environmental and Climate Impacts of Stratospheric Aerosol Injection: A Review

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Contents: 4 pages, 1 tables

Table S1. A summary of model specifications and description of base case scenarios listed in Table 1. Specifications of SRM scenario that are relevant to the discussion are included in Table 1.

Model	Altitude Limit	# vertical layers	Horizontal resolution (latitude × longitude)	SRM scenario	Aerosol or gas-precursor injection altitude	Included chemistry model?	Included ocean model?	Ref.
WACCM3	4.5×10^{-6} hPa (~150 km)	L66	1.9° × 2.5°	Geo-eng	25 km 10°N–10°S	✓	Prescribed ocean heat fluxes	1
	<u>Base case:</u> REF2 has increasing greenhouse gases (GHGs) based on A1B scenario in the 2007 IPCC report. Aerosol surface area density and sulfate mass are specified based on a non-volcanic period as measured by SAGE II.							
AER-2D CCM SOCOLv2.0	0.01 hPa	L39	3.75°	GEO1 GEO2 GEO5 GEO10 GEO5p12 GEO5p2	Equator (5°S–5°N) 20 km (19.4–20.6 km)	✓	Prescribed SSTs[a]	2
	<u>Base case:</u> GEO0 has background S concentrations.							
GISS ModelE2	0.1 mb (~80 km)	L40	2° × 2.5°	Def (default) HA (High Altitude) SmR (Small Radius) LgR (Large Radius) HALgR (High Altitude + Large Radius)	100–150 mb 20–57 mb 100–150 mb 100–150 mb 20–57 mb	✓	Prescribed SSTs	3
	<u>Base case:</u> Con (control run) is kept constant at 2000 conditions.							
ECHAM5-HAM				GE	Equator (10°N–10°S)	✓	✓	4
	<u>Base case:</u> Control simulation were run over a 5-year period (1991–1995) to reflect the atmosphere after the eruption of Mt. Pinatubo in 1991.							
IGCM	0.1 hPa			$4CO_2$ + Sulfate	~50 hPa	--	Prescribed SSTs	5
	<u>Base case:</u> Control simulation set CO_2 mixing ratio as 350 ppmv.							
ULAQ-CCM	0.04 hPa	L126	5° × 6°	G3	Equator (0° longitude)	✓	Prescribed SSTs	6

				G4	18–24 km			
GISS-E2-R	0.1 hPa	L40	2° × 2.5°	G3 G4	Equator (0° longitude) 16–25 km	✓	Coupled (1° × 1.25°, L32)	[6]
MIROC-ESM-CHEM	0.01 hPa (~85 km)	L80	2° × 2.5°	G4	Prescribed AOD[b]	✓	Coupled	[6]
GEOSCCM	0.01 hPa	L72	2° × 2.5°	G4	Equator (0° longitude) 16–25 km	✓	Prescribed SSTs	[6]
	Base case: RCP4.5 represents a future projection where the radiative forcing will increase steadily until it reaches 4.5 W m^{-2} (2005–2100) . Historical data was used for 1860–2005.[7]							
AER 2-D	~60 km	1.2 km resolution	9.5°	Al_2O_3 (0.08, 0.16, 0.24 μm) Diamond	30°S–30°N 20–25 km	✓	--	[8]
	Base case:							
HadGEM2-CCS	84 km	L60	1.25° × 1.875°	geoSulf geoBC $geoTiO_2$	Equator 23–28 km	✓	Coupled (1° × 1°, L40)	[9]
	Base case: RCP8.5 represents a future projection where the radiative forcing will increase steadily until it reaches 8.5 W m^{-2} (2005–2100) . Historical data was used for 1860–2005.[7]							
RRTM	--	--	--	Rutile Anatase α-SiC Diamond α-ZrO_2 α-Al_2O_3 $CaCO_3$ Sulfate	18–23 km	--	--	[10]
	Base case: Annual-average, zonally averaged data for 15°S to 15°N.							
AER 2-D	~60 km	1.2 km resolution	9.5°	$CaCO_3$	30°S–30°N 20–25 km	✓	--	[11]
	Base case: RCP6.0 represents a future projection where the radiative forcing will increase steadily until it reaches 6.0 W m^{-2} (2005–2100) . Historical data was used for 1860–2005.[7]							

HadGEM2-ES	~40 km	L38	1.25° × 1.875°	G4 G4NH G4SH	16–25 km	✓	Coupled	[12]
	<u>Base case:</u> RCP4.5 represents a future projection where the radiative forcing will increase steadily until it reaches 4.5 W m^{-2} (2005–2100) . Historical data (HIST) was used for 1860–2005.							
CESM CAM4-chem	3.5 mb (~40 km)	L26	0.9° × 1.25°	G4SSA	60 mb	✓	Coupled	[13]
	<u>Base case:</u> RCP6.0 represents a future projection where the radiative forcing will increase steadily until it reaches 6.0 W m^{-2} (2005–2100) . Historical data was used for 1860–2005.[7]							
MPI-ESM	0.01 hPa	L47	1.9°	G3	Equator	✓	Coupled	[14]
	<u>Base case:</u> RCP4.5 represents a future projection where the radiative forcing will increase steadily until it reaches 4.5 W m^{-2} (2005–2100) . Historical data (HIST) was used for 1860–2005.							
AER 2-D	~60 km	1.2 km resolution	9.5°	$CaCO_3$	30°S–30°N 20–25 km	✓	--	[15]
	<u>Base case:</u> RCP6.0 represents a future projection where the radiative forcing will increase steadily until it reaches 6.0 W m^{-2} (2005–2100) . Historical data was used for 1860–2005.[7]							
CESM2 (WACCM)	4.5 × 10^{-6} hPa (~130 km)	L70	0.9° × 1.25°	G6sulfur	Equator 25 km	✓	Coupled	[16,17]
CNRM-ESM2-1	0.01 hPa	L91	1°	G6sulfur	Prescribed AOD	✓	Coupled	[16,17]
ISPL-CM6A-LR	80 km	L79	1.3° × 2.5°	G6sulfur	10°S–10°N (0° longitude) 18–20 km	--	Coupled	[16,17]
MPI-ESM1.2-LR	0.01 hPa	L47	1.9°	G6sulfur	Prescribed AOD	--	Coupled	[16,17]
MPI-ESM1.2-HR	0.01 hPa	L95	0.93°	G6sulfur	Prescribed AOD	--	Coupled	[16,17]
UKESM1-0-LL	85 km	L85	1.25° × 1.875°	G6sulfur	10°S–10°N (0° longitude) 18–20 km	✓	Coupled	[16,17]
	<u>Base case:</u> SSP5-8.5 represents a Shared Socioeconomic Pathway long-term extension scenario whose details are listed in O'Neill et al. (2016).[18]							

[a] Sea surface temperatures (SSTs) and sometimes sea ice were prescribed with an average value instead of a fully-coupled atmosphere-ocean model.
[b] aerosol optical depth (AOD).

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